AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

Claim 1 (Original): An apparatus comprising:

a rendering engine that defines a rectangular area of pixels that bounds a triangular area of the pixels, wherein the rectangular area of pixels includes one or more lines of pixels;

the rendering engine further selects each of the one or more lines of pixels within the rectangular area of pixels, sequentially evaluates coordinates associated with the pixels of each line of pixels to determine whether the pixels fall within the triangle area, ceases evaluation of the coordinates associated with the pixels of each line of pixels upon determining that at least one pixel of the line falls within the triangle area and a current pixel no longer falls within the triangle area, and stores information indicating which of the pixels fall within the triangle area.

Claim 2 (Original): The apparatus of claim 1, wherein the rendering engine evaluates the coordinates of the pixels in accordance with a set of linear equations that describe edges of the triangular area.

Claim 3 (Currently Amended): The apparatus of claim 2, wherein the rendering engine computes a coefficient matrix M_C for computing linear coefficients for the set of linear equations, and applies the coefficient matrix M_C to ~~each of the~~ one or more pixels within the rectangular area to determine whether each of the one or more pixels falls within the triangular area.

Claim 4 (Original): The apparatus of claim 3, wherein the rendering engine applies the coefficient matrix M_C to a current one of the pixels (X_C, Y_C) within the rectangular area to determine whether:

$$M_C \begin{bmatrix} X_C \\ Y_C \\ 1 \end{bmatrix} \leq \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}, \text{ where}$$

the coefficient matrix M_C equals:

$$M_c = \begin{bmatrix} y_1 - y_2 & x_2 - x_1 & x_1 y_2 - x_2 y_1 \\ y_2 - y_0 & x_0 - x_2 & x_2 y_0 - x_0 y_2 \\ y_0 - y_1 & x_1 - x_0 & x_0 y_1 - x_1 y_0 \end{bmatrix} \text{ and}$$

vertices $v_0(x_0,y_0)$, $v_1(x_1,y_1)$, and $v_2(x_2,y_2)$ are vertices of the triangular area.

Claim 5 (Original): The apparatus of claim 1, wherein the rendering engine selectively renders the pixels that fall within the triangular area by computing updated pixel data for those pixels in accordance with a set of linear equations that describe one or more attributes associated with the triangular area.

Claim 6 (Original): The apparatus of claim 5, wherein the attribute values comprise at least one of color values and texture values.

Claim 7 (Original): The apparatus of claim 5, wherein the rendering engine computes a coefficient matrix M^{-1} for computing linear coefficients A, B, C of the set of linear equations, and applies the coefficients A, B, C to each pixel that falls within the triangular area to compute an attribute value for the respective pixel.

Claim 8 (Currently Amended): The apparatus of claim 7, wherein the rendering engine applies the coefficient matrix M^{-1} to compute the linear coefficients A, B, C, for an attribute associated with vertices $v_0(x_0,y_0)$, $v_1(x_1,y_1)$, and $v_2(x_2,y_2)$ of the triangle as:

$$\begin{bmatrix} A \\ B \\ C \end{bmatrix} = M^{-1} \begin{bmatrix} v_0 \\ v_1 \\ v_2 \end{bmatrix},$$

where the coefficient matrix ~~M^{-1}~~ M equals:

$$M = \begin{bmatrix} x_0 & y_0 & 1 \\ x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \end{bmatrix}, \text{ ~~and~~}$$

where the coefficient M^{-1} equals:

$$M^{-1} = \frac{1}{\det(M)} M_C^T,$$

where det(M) equals:

$$\det(M) = |M| = x_1 y_2 + x_2 y_0 + x_0 y_1 - x_2 y_1 - x_0 y_2 - x_1 y_0, \text{ and}$$

an attribute value for each pixel (X_c, Y_c) is computed as

$$v = AX_c + BY_c + C.$$

Claim 9 (Original): The apparatus of claim 1, further comprising a z-buffer storing a set of z-values associated with the pixels, and wherein the rendering engine compares a z-value, z_c, of the current pixel with a corresponding z-value, z_b, of a z-buffer to determine whether each pixel within the rectangular area is visible and selectively renders each pixel of the rectangular area that is visible and that falls within the triangle area.

Claim 10 (Original): The apparatus of claim 1, further comprising a control unit that issues a command to the rendering engine that specifies vertices of the triangular area.

Claim 11 (Currently Amended): The apparatus of claim 1, wherein the rendering engine comprises:

a vertex buffer for buffering the vertices of the triangular area to be rendered;

a bounding box generator that processes the vertices to compute bounding data that define the dimensions of the rectangular area; and

a rasterizer that processes the bounding data and evaluates coordinates associated with one or more of the pixel values of the rectangular area to selectively render ~~the~~ pixels that fall within the triangular area.

Claim 12 (Original): The apparatus of claim 11, further comprising:

an edge coefficient generator that receives the vertices buffered by the vertex buffer and processes the vertices to compute linear coefficients for a set of linear equations that describe edges of the triangular area, and

an attribute coefficient generator that processes the vertices to compute linear coefficients for a set of linear equations that describe one or more attributes associated with the triangular area, wherein

the rasterizer processes the bounding data and the coefficients in accordance with the sets of linear equations to render the pixels that fall within the triangular area.

Claim 13 (Original): The apparatus of claim 1, wherein the apparatus comprises a wireless communication device.

Claim 14 (Original): The apparatus of claim 1, wherein the apparatus comprises an integrated circuit.

Claim 15 (Currently Amended): The apparatus of claim 1, further comprising a cache memory to store at least a portion of the pixels within the rectangular area, wherein the cache memory has a block size, and the rendering engine defines the rectangular area as a function of the block size of the cache memory.

Claims 16-31 (Cancelled)

Claim 32 (Currently Amended): An apparatus comprising:

means for rendering ~~means~~ that defines a rectangular area of pixels that bounds a triangular area of the pixels, wherein the rectangular area of pixels includes one or more lines of pixels;

the ~~rendering~~ means for rendering further selects each of the one or more lines of pixels within the rectangular area of pixels, sequentially evaluates coordinates associated with the pixels of each line of pixels to determine whether the pixels fall within the triangle area, and ceases evaluation of the coordinates associated with the pixels of each line of pixels upon

determining that at least one pixel of the line falls within the triangle area and a current pixel no longer falls within the triangle area[[,]]; and

means for ~~stores~~ storing information indicating which of the pixels fall within the triangle area.

Claim 33 (Currently Amended): The apparatus of claim 32, wherein the means for rendering ~~means~~ evaluates the coordinates of the pixels in accordance with a set of linear equations that describe edges of the triangular area.

Claim 34 (Currently Amended): The apparatus of claim 33, wherein the means for rendering ~~means~~ computes a coefficient matrix M_C for computing linear coefficients for the set of linear equations, and applies the coefficient matrix M_C to ~~each of the~~ one or more pixels within the rectangular area to determine whether each of the one ore more pixels falls within the triangular area.

Claim 35 (Currently Amended): The apparatus of claim 34, wherein the means for rendering ~~means~~ applies the coefficient matrix M_C to a current one of the pixels (X_C, Y_C) within the rectangular area to determine whether:

$$M_C \begin{bmatrix} X_C \\ Y_C \\ 1 \end{bmatrix} \leq \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}, \text{ where}$$

the coefficient matrix M_C equals:

$$M_c = \begin{bmatrix} y_1 - y_2 & x_2 - x_1 & x_1y_2 - x_2y_1 \\ y_2 - y_0 & x_0 - x_2 & x_2y_0 - x_0y_2 \\ y_0 - y_1 & x_1 - x_0 & x_0y_1 - x_1y_0 \end{bmatrix} \text{ and}$$

vertices $v_0(x_0,y_0)$, $v_1(x_1,y_1)$, and $v_2(x_2,y_2)$ are vertices of the triangular area.

Claim 36 (Currently Amended): The apparatus of claim 32, wherein the means for rendering ~~means~~ selectively renders the pixels that fall within the triangular area by computing updated

pixel data for those pixels in accordance with a set of linear equations that describe one or more attributes associated with the triangular area.

Claim 37 (Previously Presented): The apparatus of claim 36, wherein the attribute values comprise at least one of color values and texture values.

Claim 38 (Currently Amended): The apparatus of claim 36, wherein the means for rendering ~~means~~ computes a coefficient matrix M^{-1} for computing linear coefficients A, B, C of the set of linear equations, and applies the coefficients A, B, C to each pixel that falls within the triangular area to compute an attribute value for the respective pixel.

Claim 39 (Currently Amended): The apparatus of claim 38, wherein the means for rendering ~~means~~ applies the coefficient matrix M^{-1} to compute the linear coefficients A, B, C, for an attribute associated with vertices $v_0(x_0,y_0)$, $v_1(x_1,y_1)$, and $v_2(x_2,y_2)$ of the triangle as:

$$\begin{bmatrix} A \\ B \\ C \end{bmatrix} = M^{-1} \begin{bmatrix} v_0 \\ v_1 \\ v_2 \end{bmatrix},$$

where the coefficient matrix ~~M^{-1}~~ M equals:

$$M = \begin{bmatrix} x_0 & y_0 & 1 \\ x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \end{bmatrix}, \text{ ~~and~~}$$

where the coefficient matrix M^{-1} equals:

$$M^{-1} = \frac{1}{\det(M)} M_C^T,$$

where $\det(M)$ equals:

$$\det(M) = |M| = x_1y_2 + x_2y_0 + x_0y_1 - x_2y_1 - x_0y_2 - x_1y_0, \text{ and}$$

an attribute value for each pixel (X_c, Y_c) is computed as

$$v = AX_c + BY_c + C.$$

Claim 40 (Currently Amended): The apparatus of claim 32, further comprising a means for storing a set of z-values associated with the pixels, and wherein the means for rendering ~~means~~ compares a z-value, z_c, of the current pixel with a corresponding z-value, z_b, of a z-buffer to determine whether each pixel within the rectangular area is visible and selectively renders each pixel of the rectangular area that is visible and that falls within the triangle area.

Claim 41 (Currently Amended): The apparatus of claim 32, further comprising a means for controlling ~~control means~~ that issues a command to the means for rendering ~~means~~ that specifies vertices of the triangular area.

Claim 42 (Currently Amended): The apparatus of claim 32, wherein the means for rendering ~~means~~ comprises:

means for buffering the vertices of the triangular area to be rendered;

means ~~that processes~~ for processing the vertices to compute bounding data that define the dimensions of the rectangular area; and

means ~~that processes~~ for processing the bounding data and evaluates coordinates associated with one or more of the pixel values of the rectangular area to selectively render ~~the~~ pixels that fall within the triangular area.

Claim 43 (Currently Amended): The apparatus of claim 42, further comprising:

means for receiving ~~that receives~~ the vertices buffered by the ~~vertex buffer~~ means for buffering and means for processing ~~processes~~ the vertices to compute linear coefficients for a set of linear equations that describe edges of the triangular area, and

means ~~that processes~~ for processing the vertices to compute linear coefficients for a set of linear equations that describe one or more attributes associated with the triangular area, wherein

the means ~~that processes~~ for processing the bounding data processes the bounding data and the coefficients in accordance with the sets of linear equations to render the pixels that fall within the triangular area.

Claim 44 (Previously Presented): The apparatus of claim 32, wherein the apparatus comprises a wireless communication device.

Claim 45 (Previously Presented): The apparatus of claim 32, wherein the apparatus comprises an integrated circuit.

Claim 46 (Currently Amended): The apparatus of claim 32, further comprising a cache memory to store at least a portion of the pixels within the rectangular area, wherein the cache memory has a block size, and the means for rendering ~~means~~ defines the rectangular area as a function of the block size of the cache memory.

Claim 47-61 (Cancelled)

Claim 62 (Currently Amended): ~~A computer program product stored on a~~ A computer-readable storage medium comprising instructions that cause one or more processors to:

~~code for causing a computer to~~ define a rectangular area of pixels that bounds a triangular area of the pixels, wherein the rectangular area of pixels includes one or more lines of pixels;

~~code for causing a computer to~~ select each of the one or more lines of pixels within the rectangular area of pixels;

~~code for causing a computer to~~ sequentially evaluate coordinates associated with the pixels of each line of pixels to determine whether the pixels fall within the triangle area[[,]];

~~code for causing a computer to~~ cease evaluation of the coordinates associated with the pixels of each line of pixels upon determining that at least one pixel of the line falls within the triangle area and a current pixel no longer falls within the triangle area[[,]]; and

~~code for causing a computer to~~ store information indicating which of the pixels fall within the triangle area.

Claim 63 (Currently Amended): The computer ~~program product~~ readable storage medium of claim 62, wherein the coordinates of the pixels are evaluated in accordance with a set of linear equations that describe edges of the triangular area.

Claim 64 (Currently Amended): The computer ~~program product~~ readable storage medium of claim 63, further ~~including code for causing a computer~~ comprising instructions that cause one or more processors to compute a coefficient matrix M_C for computing linear coefficients for the set of linear equations, and ~~code for causing a computer~~ to apply the coefficient matrix M_C to ~~each of the~~ one or more pixels within the rectangular area to determine whether each of the one or more pixels falls within the triangular area.

Claim 65 (Currently Amended): The computer ~~program product~~ readable storage medium of claim 64, further ~~including code for causing a computer~~ comprising instructions that cause one or more processors to apply the coefficient matrix M_C to a current one of the pixels (X_C, Y_C) within the rectangular area to determine whether:

$$M_C \begin{bmatrix} X_C \\ Y_C \\ 1 \end{bmatrix} \leq \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}, \text{ where}$$

the coefficient matrix M_C equals:

$$M_C = \begin{bmatrix} y_1 - y_2 & x_2 - x_1 & x_1y_2 - x_2y_1 \\ y_2 - y_0 & x_0 - x_2 & x_2y_0 - x_0y_2 \\ y_0 - y_1 & x_1 - x_0 & x_0y_1 - x_1y_0 \end{bmatrix} \text{ and}$$

vertices $v_0(x_0,y_0)$, $v_1(x_1,y_1)$, and $v_2(x_2,y_2)$ are vertices of the triangular area.

Claim 66 (Currently Amended): The computer ~~program product~~ readable storage medium of claim 62, further ~~including code for causing a computer~~ comprising instructions that cause one or more processors to selectively render the pixels that fall within the triangular area by computing updated pixel data for those pixels in accordance with a set of linear equations that describe one or more attributes associated with the triangular area.

Claim 67 (Currently Amended): The computer ~~program product~~ readable storage medium of claim 66, wherein the attribute values comprise at least one of color values and texture values.

Claim 68 (Currently Amended): The computer ~~program product~~ readable storage medium of claim 66, further ~~including code for causing a computer~~ comprising instructions that cause one or more processors to compute a coefficient matrix M^{-1} for computing linear coefficients A, B, C of the set of linear equations, and ~~code for causing a computer~~ to apply the coefficients A, B, C to each pixel that falls within the triangular area to compute an attribute value for the respective pixel.

Claim 69 (Currently Amended): The computer ~~program product~~ readable storage medium of claim 68, further ~~including code for causing a computer~~ comprising instructions that cause one or more processors to apply the coefficient matrix M^{-1} to compute the linear coefficients A, B, C, for an attribute associated with vertices $v_0(x_0,y_0)$, $v_1(x_1,y_1)$, and $v_2(x_2,y_2)$ of the triangle as:

$$\begin{bmatrix} A \\ B \\ C \end{bmatrix} = M^{-1} \begin{bmatrix} v_0 \\ v_1 \\ v_2 \end{bmatrix},$$

where the coefficient matrix ~~M^{-1}~~ M equals:

$$M = \begin{bmatrix} x_0 & y_0 & 1 \\ x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \end{bmatrix}, \text{ ~~and~~}$$

where the coefficient matrix M^{-1} equals:

$$M^{-1} = \frac{1}{\det(M)} M_C^T,$$

where $\det(M)$ equals:

$$\det(M) = |M| = x_1y_2 + x_2y_0 + x_0y_1 - x_2y_1 - x_0y_2 - x_1y_0, \text{ and}$$

an attribute value for each pixel (X_c, Y_c) is computed as

$$v = AX_c + BY_c + C.$$

Claim 70 (Currently Amended): The computer ~~program product~~ readable storage medium of claim 62, further ~~including code for causing a computer~~ comprising instructions that cause one or more processors to store in a z-buffer a set of z-values associated with the pixels, and ~~code for causing a computer~~ to compare a z-value, z_c, of the current pixel with a corresponding z-value,

z_b, of a z-buffer to determine whether each pixel within the rectangular area is visible and selectively renders each pixel of the rectangular area that is visible and that falls within the triangle area.

Claim 71 (Currently Amended): The computer ~~program product~~ readable storage medium of claim 62, further ~~including code for causing a computer~~ comprising instructions that cause one or more processors to [[f]] issue a command that specifies vertices of the triangular area.

Claim 72 (Currently Amended): The computer ~~program product~~ readable storage medium of claim 62, further ~~including~~ comprising instructions that cause one or more processors to:

~~code for causing a computer to~~ buffer the vertices of the triangular area to be rendered;

~~code for causing a computer to~~ process the vertices to compute bounding data that define the dimensions of the rectangular area; and

~~code for causing a computer to~~ process the bounding data and evaluating coordinates associated with one or more of the pixel values of the rectangular area to selectively render ~~the~~ pixels that fall within the triangular area.

Claim 73 (Currently Amended): The computer ~~program product~~ readable storage medium of claim ~~62~~ 72, further ~~including~~ comprising instructions that cause one or more processors to:

~~code for causing a computer to~~ receive the ~~vertices~~ buffered vertices ~~by the vertex buffer~~ and process the vertices to compute linear coefficients for a set of linear equations that describe edges of the triangular area, and

~~code for causing a computer to~~ process the vertices to compute linear coefficients for a set of linear equations that describe one or more attributes associated with the triangular area, wherein

the bounding data and the coefficients are processed in accordance with the sets of linear equations to render the pixels that fall within the triangular area.

Claim 74 (Currently Amended): The computer ~~program product~~ readable storage medium of claim 62, wherein the ~~computer program product~~ instructions [[is]] are contained in a wireless communication device.

Claim 75 (Currently Amended): The computer ~~program product~~ readable storage medium of claim 62, wherein the ~~computer program product is executed by an~~ one or more processors are integrated circuits.

Claim 76 (Currently Amended): The computer ~~program product~~ readable storage medium of claim 62, further ~~including code for causing a computer~~ comprising instructions that cause one or more processors to store to a cache memory at least a portion of the pixels within the rectangular area, wherein the cache memory has a block size, and ~~code for causing a computer~~ to define the rectangular area as a function of the block size of the cache memory.

Claim 77 (New): The apparatus of claim 1, wherein the rendering engine sequentially evaluates coordinates associated with the pixels of each line of pixels in a rightward and downward fashion.

Claim 78 (New): The apparatus of claim 32, wherein the means for rendering sequentially evaluates coordinates associated with the pixels of each line of pixels in a rightward and downward fashion.

Claim 79 (New): The computer readable storage medium of claim 62, wherein sequentially evaluate coordinates associated with the pixels of each line of pixels to determine whether the pixels fall within the triangle area comprises evaluating the pixels in a rightward and downward fashion.